



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|---------------------|------------------|
| 10/673,173 | 09/30/2003 | Yukihiko Nakata | 243339US3 | 1250 |
| 22850 | 7590 | 08/25/2005 | EXAMINER | |
| OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314 | | | BUEKER, RICHARD R | |
| | | | ART UNIT | PAPER NUMBER |

1763

DATE MAILED: 08/25/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/673,173

Applicant(s)

NAKATA ET AL.

Examiner

Richard Bueker

Art Unit

1763

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 12/30/03.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: ____.

The reference identified as AY in applicants' IDS filed 12/30/03 has not been considered because no copy of this reference is in the official record.

Claims 1-15 and 18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The apparatus claims are vague and indefinite because they define the structure of the apparatus in terms of the size of a substrate to be processed, but the substrate that is referred to is not a part of the apparatus. The claimed apparatus is capable of processing substrates of a wide variety of sizes, and the particular size of a substrate to be placed inside the apparatus is a process variable to be determined in the future. See Ex Parte Brummer 12 USPQ2d 1653. Also, in claim 5, the phrase "check pattern" is non-idiomatic, vague and indefinite. In claim 18, the recited groups 12-16 of the periodic table are unclear and indefinite.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-11, 16, 17 and 19 are rejected under 35 U.S.C. 102(b) or (e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Sakuma I (WO 01/82348) or Sakuma II (6,891,131). Sakuma I and II have equivalent disclosures and the discussion below will refer to Sakuma II (6,891,131). Sakuma (see fig. 9) discloses a substrate processing apparatus having a light source, a light transmitting

Art Unit: 1763

window and a reaction chamber in which a substrate to be processed can be placed.

The frame 66 and frames 72 form plural windows as claimed by applicants. See col. 8, lines 19-58 of Sakuma, for example. Sakuma teaches that the windows can be provided in a variety of shapes and patterns, including a lattice pattern (col. 8, lines 39-44) which reads on a “check pattern as recited in claim 5. Sakuma’s apparatus includes a substrate rotation means for improving the uniformity of radiation (col. 1, lines 31-35) onto the substrate per unit time. The substrate rotation of Sakuma moves the substrate in a direction that is parallel to the plane of the chamber window. Also, the rotation of Sakuma “swings the substrate” as recited in claims 6-8, because the dictionary definition of “swing” is “to turn on an axis”, “to move in or describe a circle”, or “to turn on a hinge or a pivot”. The rotating movement of Sakuma meets these definitions of “swing”. Regarding claim 10, it is noted that because of the “comprises” language of the claims, the claim 10 recitation of “the driving mechanism moves the substrate in one direction” does not exclude a driving mechanism that moves a substrate in one direction and also moves the substrate in one or more other directions.

Claims 6-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sakuma I (WO 01/82348) or Sakuma II (6,891,131) taken in view of Tolt (6,432,206) (abstract), Murakami (5,431,738) (Fig. 7), Miller (6,521,048) (Fig. 17) or Wertheimer (4,728,863) (Figs. 1-4), all of whom teach the step of moving a substrate in a reciprocating motion or swinging motion, for the purpose of causing a more uniform treatment of a substrate in a processing apparatus. These references teach that a swinging motion is a well-known alternative to the more common rotating motion

Art Unit: 1763

illustrated by Sakuma. It would have been obvious to use such a swinging motion as an alternative to, or in addition to, the rotation of Sakuma, because the secondary references make clear that reciprocation or swinging was an art recognized equivalent to rotation for the purpose of increasing uniformity of treatment of a substrate in a processing apparatus.

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sakuma I (WO 01/82348) or Sakuma II (6,891,131) taken in view of Iwasaki (5,174,881) and Maeda (5,314,538) who teach that it is desirable to place another chamber adjacent to a lamp processing chamber of the type taught by Sakuma. It would have been obvious to one skilled in the art to adapt the apparatus of Sakuma by placing it adjacent another chamber to allow plural processing steps as taught by Iwasaki and Maeda (5,314,538).

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sakuma I (WO 01/82348) or Sakuma II (6,891,131) taken in view of Takasu (5,261,961) or Shinriki (6,143,081), who teaches that it is desirable to place another chamber adjacent to a lamp processing chamber of the type taught by Sakuma. It would have been obvious to one skilled in the art to adapt the apparatus of Sakuma by placing it adjacent another chamber to allow plural processing steps as taught by Shinriki.

Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sakuma I (WO 01/82348) or Sakuma II (6,891,131) taken in view of Takasu (5,261,961), Inayoshi (JP 2-182883) or Iwasaki (5,174,881), each of whom teaches that a low-pressure mercury lamp can be use for photochemical processing of a substrate held in

Art Unit: 1763

a vacuum chamber, and it would have been obvious to use a low-pressure mercury lamp as the lamp of Sakuma in view of the teachings of Takasu, Inayoshi or Iwasaki.

Claims 14, 15 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sakuma I (WO 01/82348) or Sakuma II (6,891,131) taken in view of applicants' description of the prior art (see Fig. 12 and pages 3-6 of applicants' specification). As described by applicants, when xenon eximer lamps were conventionally used to irradiate the interior of vacuum chambers for photo-oxidation, the problems caused by the pressure differential across the chamber window was the same as described by Sakuma. Therefore, it would have been obvious to one skilled in the art to use the plural window system taught by Sakuma in the chamber of applicants' Fig. 12, to mitigate the same problems caused by pressure differential.

Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sakuma I (WO 01/82348) or Sakuma II (6,891,131) taken in view of Beinglass (5,576,059) (col. 1, lines 18-39, for example, who teaches that silicon semiconductor films are typically formed in the prior art in lamp heated chambers of the type taught by Sakuma, and it would have been obvious to deposit a doped polysilicon layer of the type described by Beinglass in the apparatus of Sakuma. Also, it is noted that Sakuma (col. 12, lines 28-32) teaches the step of depositing polysilicon in his chamber.

Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sakuma I (WO 01/82348) or Sakuma II (6,891,131) taken in view of Iwasaki (5,174,881) and in further view of Shinriki (6,143,081), Beinglass (5,576,059) and Nakata (Asia Display/IDW '01). Iwasaki teaches that photo-etching is a desirable pretreatment step


Art Unit: 1763

for a silicon wafer prior to forming a film on the wafer. Sakuma, Shinriki, Beinglass and Nakata all teach a step of forming a film on a semiconductor wafer by photo-process. It would have been obvious to one skilled in the art to pretreat the wafers in the process of , Shinriki, Beinglass and Nakata to remove a native oxide in the manner taught by Iwasaki.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Richard Bueker whose telephone number is (571) 272-1431. The examiner can normally be reached on 9 AM - 5:30 PM, Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parvis Hassanzadeh can be reached on (571) 272-1435. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Richard Bueker
Primary Examiner
Art Unit 1763